PROBLEMS FOR SOLUTION.

ALGEBRA.

174. Proposed by HARRY S. VANDIVER, Bala, Pa.

If the quantity x be expressed in the form of a continued fraction P_n/Q_n denoting the $(n+1)$th convergent, with x_n the corresponding complete quotient, then $\dfrac{P_{n-(k+1)}-Q_{n-(k+1)}x}{P_n-Q_nx}=(-1)^{k+1}x_n\times x_{n-1}\ldots.x_{n-k}$.

175. Proposed by W. J. GREENSTREET, M. A., Editor of The Mathematical Gazette, Stroud, England.

Find the conditions that $\dfrac{x}{m+3}+\dfrac{y}{m-1}+\dfrac{z}{m-z}=1$, where m may be a, b, or c.

176. Proposed by MARCUS BAKER, U. S. Geological Survey, Washington, D. C.

Solve $x^2+y^2+z=a\ldots.(1)$, $x+y^2+z^2=b\ldots.(2)$, $x^2+y+z^2=c\ldots.(3)$.

GEOMETRY.

197. Proposed by L. C. WALKER, A. M., Graduate Student, Leland Stanford Jr. University, Cal.

Two points P_1, Q_1 are on a generator of a hyperboloid, and P_2, Q_2 the corresponding points on a confocal hyperboloid. Prove $P_1Q_1=P_2Q_2$.

198. Proposed by JOHN J. QUINN, Professor of Mathematics, Warren High School, Warren, Pa.

Trisect an angle, (1) by means of the cissoid; (2) by means of the paraboloid.

199. Proposed by F. ANDEREGG, A. M., Professor of Mathematics, Oberlin College, Oberlin, O.

Two verticies of a given triangle move along fixed right lines; find the locus of the third. [From Salmon's Conics, Sixth Edition, p. 208, ex. 10.]

CALCULUS.

163. Proposed by F. P. MATZ, Sc. D., Ph. D., Professor of Mathematics and Astronomy in Defiance College, Defiance, Ohio.

Can there be a plane curve the length of which varies *directly as the abscissa* and *inversely as the ordinate* of any point on the curve?

164. Proposed by G. B. M. ZERR, A. M., Ph. D., Professor of Chemistry and Physics, The Temple College, Philadelphia, Pa.

If $m^2+n^2=1, m^2\cos^2\theta+n^2\cos^2\varphi=A$, $a^2b^2\sin^2\theta(m^2+n^2\cos^2\varphi)+a^2c^2\cos^2\theta\cos^2\varphi$ $+b^2c^2\sin^2\varphi(n^2+m^2\cos^2\theta)=B, \sqrt{(1-m^2\sin^2\theta)}=\Delta(\theta), \sqrt{(1-n^2\sin^2\varphi)}=\Delta(\varphi)$, prove that $\displaystyle\int_0^{\frac{1}{2}\pi}\int_0^{\frac{1}{2}\pi}\frac{ABd\theta d\varphi}{\Delta(\theta)\Delta(\varphi)}=\frac{\pi}{6}(a^2b^2+a^2c^2+b^2c^2)$.